



Office of Energy Efficiency
and Renewable Energy

High-Efficiency, Low-Emissions Fuel-Cell Technologies Used in GM Minivan

Background

In the United States, transportation accounts for 66% of total petroleum consumption and two-thirds of all greenhouse gas emissions. Fuel-cell-powered hybrid electric vehicles (HEVs) can significantly reduce petroleum consumption and decrease greenhouse gas emissions.

Accomplishments

- ◆ Laboratory demonstration has shown the feasibility of converting gasoline and other fuels, such as methanol, into hydrogen for use in a fuel cell.
- ◆ A methanol-powered fuel-cell system has been developed that will fit into an HEV. At the heart of the system is an onboard fuel processor that converts methanol to hydrogen, which allows HEVs to be refueled in the same manner as conventional vehicles.
- ◆ General Motors Corporation has incorporated this fuel-cell technology into the Zafira concept minivan, which was presented at the Mondial de L'Automobile auto show in Paris, France, in September 1998.

Benefits

- ◆ Increases efficiency to twice that of current conventional automotive engines.
- ◆ Achieves 80 mpg when combined with a lightweight body and chassis.
- ◆ Reduces pollutants (grams per mile): particulates from 0.08 to 0.00; hydrocarbons from 0.50 to 0.04; carbon monoxide from 3.40 to 0.00; and nitrous oxides from 0.40 to 0.00, all of which are at or below the California ultra-low-emission vehicle standard.



*General Motors Corporation
Zafira Minivan*

- ◆ Reduces carbon dioxide emissions by 50%.
- ◆ Could save consumers \$2.5 billion (1995 dollars) in fuel costs by 2020.
- ◆ Could result in 4.7 million metric tons of carbon reduction and .11 million barrels per day of oil reduction by 2020.

Future Activities

- ◆ Demonstrate feasibility of fuel-cell vehicles operating on gasoline.
- ◆ Substantially reduce cost.
- ◆ Demonstrate 5,000-hour reliability and durability.
- ◆ Reduce system start-up time.

Partners in Success

Ballard Power Systems
General Motors Corporation

Contact

Pat Davis: (202) 586-8061

